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ABSTRACT

A study was conducted to evaluate children's ability to comprehend main ideas after reading connected discourse and to develop and validate a straightforward and intuitively simple system for identifying main ideas in prose. Three experimental passages were randomly selected from third and sixth grade social studies textbooks, and education students extracted theme and main idea information. The subjects, 83 third grade and 89 sixth grade students, each read two of the three texts. When they had read the first passage, they returned the passage to a folder, wrote a single sentence telling what the whole story was about, then wrote as much as they could remember about the story. After reading the second passage, the students were asked to (1) choose from seven statements the one that best told what the story was about, (2) answer 12 multiple choice questions on the main idea and details, and (3) determine whether each of 12 statements referred to were main ideas, details, or false statements. The results suggested that elementary school students who read expository prose tended not to comprehend either the gist of an entire passage or its main ideas with great facility. The main identification strategy developed for use in the study proved to be reliable and practical. (HTH)

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Children's Ability to Comprehend Main Ideas After Reading Expository Prose

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Children's Ability to Comprehend Main Ideas
After Reading Expository Prose

Research investigating children's ability to comprehend the main ideas or central thoughts of prose is mixed. Results of several studies (Brown & Smiley, 1977; Christie & Schumacher, 1975; Danner, 1976; Meyer, 1977; Waters, 1978) have indicated that children are reasonably skillful at comprehending main idea, gist information. Findings of several other studies (Baumann, 1981; Dunn, Matthews, & Bieger, 1979; Otto, Barrett, & Koenke, 1968; Taylor, 1980; Tierney, Bridge, & Cera, 1978-79) revealed that children are not highly proficient at comprehending the central thoughts of prose passages.

A careful review of these studies revealed that the external validity (or ecological validity, Bronfenbrenner, 1976) of this body of research is severely limited. This is especially true if the environment to which generalizations are to be made is children's reading comprehension behavior in the elementary classroom. It was the purpose of this study to evaluate children's ability to comprehend main ideas after reading connected discourse in a manner that justified generalizing the findings to children's classroom reading behavior. To accomplish this, groups of third and sixth grade students within their own classrooms read unaltered, natural expository passages that were randomly selected from existing curricular materials (social studies textbooks). Main idea comprehension was then assessed by administering a series of traditional reading comprehension measures.

A secondary purpose of the study was to develop and validate a straightforward and intuitively simple system for identifying main ideas in prose. Existing prose analysis systems (e.g., Johnson, 1970; Kintsch, 1974; Meyer, 1975) are unnecessarily complex for educational research and were not specifically

designed to identify main ideas. Consequently, a new procedure--designed solely for the purpose of identifying main ideas and discriminating them from details--was developed and employed in the present study.

Method

Subjects

Classes of heterogeneously grouped third and sixth grade students from two schools in a suburban Dallas, Texas, school district participated in the study. This sample consisted of 83 third graders and 89 sixth graders.

Materials

Three experimental passages at each grade level were randomly selected from pools of potential texts which were taken from third and sixth grade social studies textbooks. (See Baumann, 1981, for a description of these passage pools.) Table 1 presents a brief description of each experimental text along with additional information which will be discussed.

Identification of Main Ideas

Based upon Johnson's (1970) concept of pausal units, the experimental texts were segmented into linguistic subunits. Essentially this involved dividing each text into independent and dependent clauses and some prepositional phrases. Undergraduate education majors read each passage two times and completed two tasks. First, the students were asked to compose and write down a single sentence that contained the main theme of the passage (i.e., a gist statement). The students were then asked to examine the text and underline the portions of the passage they believed contained the most important (main idea) information. The experimenter and an additional person examined the gist statements and grouped together identical statements and paraphrases. For all six passages, one cluster of statements represented the majority of responses, and this statement was designated the gist statment. Underlined main idea statements were

Table 1

Descriptive Information for the Six Experimental Texts

Passage[a]	Title	Description	No. of words	No. of subunits		No. of main ideas
				main idea	detail	
A	A Changing City	Describes how Montreal has changed during the last 50 years	276	10	29	7
B	A City that was Planned	Describes how Washington D.C. was chosen as the nation's capital	279	12	20	9
C	Food of the Woodland Indians	Discusses varieties of foods Indians grew and gathered	317	7	36	7
D	A Powerful Ruler	Discusses Julius Caesar's rise to power and his reign as emperor of Rome	255	8	23	6
E	Steam Power	Discusses the development of the steam engine and its uses in the 18th and 19th centuries	317	11	27	6
F	The Pyramids	Describes how the pyramids were constructed and the mummification process	359	11	31	5

[a]Passages A, B, and C are third grade texts; Passages D, E, and F are sixth grade texts.

similarly clustered and assigned a percentage score. Main idea statements with scores of 50 percent or greater were designated as the main ideas for each passage. Text portions not labeled main ideas were considered to represent details. The experimenter and one additional person trained in these procedures independently segmented all six tests and analyzed the gist statements and main idea statements. In all instances inter-rater agreement scores were greater than .92. Table 2 presents one of the experimental texts in its segmented form along with the corresponding gist and main idea statements.

Procedure and Dependent Measures

The data were gathered in two sittings. The three passages at each grade level were randomly assigned so that each student read two of the three texts--one at the first sitting, another at the second. The students were directed to silently read each passage two times. When they were finished, the students were directed to return the passage to their folder of materials and then work on a packet of word puzzles and mazes. This filler task was included to control for short term memory (cf., Tierney et al., 1978-79). Ten minutes after the last student had finished reading, gist and main idea comprehension were assessed by several dependent measures.

Cued written recall. At the first sitting after the ten minute filler period, the students were provided with an alphabetical listing of all content words from the passage (nouns, verbs, adjectives, adverbs). Using this as an aid for recall and spelling, the students were required to first "write a single sentence that tells what the whole story was about." The students were then directed to "write down as much as you can remember about the story you read."

Gist statement recognition. At the second sitting, the students were required to respond to three dependent measures after reading the second passage. The first task was a gist statement recognition test in which

Table 2
A Sample Passage at the Sixth Grade Level
Presented in its Segmented Form

A Powerful Ruler

One of the greatest rulers of Rome was Julius Caesar (59%),/ who was born into a patrician family/ around 100 B.C./ Caesar was trained for a life of government service,/ but he also became one of Rome's greatest generals (64%)./ He knew that winning victories in a war would help him to gain power./ In 58 B.C./ Caesar led an army that took over Gaul,/ which today is called France./

However, the Roman Senate did not like Caesar's growing power./ The Senate ordered him to return to Rome without his army./ Instead, Caesar led his army to Rome/ and took over the government (53%)./

After taking power,/ Caesar made changes to improve Rome (94%)./ He put honest people into government jobs./ Caesar also made taxes fairer,/ and he gave land to the poor./ And he began the use of a new calendar throughout all Roman lands (53%)./ This was the Julian calendar./ It divided the year into twelve months/ of thirty or thirty-one days each,/ except for February, which had twenty-nine days./ But every fourth year February had thirty days./ This calendar was used throughout much of the world/ for more than 1,500 years./ Why do you think it was important for all Roman lands to use the same calendar?/

Caesar was very powerful./ Some of the people in the Roman Senate were afraid that he would make himself king of Rome./ So they planned to murder him./ Caesar was killed in March of 44 B.C. (68%)./ Today Caesar is remembered as a great Roman general and government leader./

Gist Statement: Julius Caesar was a great and powerful ruler of Rome. (71%)

Note. Slashes mark linguistic subunit boundaries. Underlined sections indicate main ideas; sections not underlined are detail subunits. Percentages of university students listing each main idea are parenthetically presented following each main idea.

the subjects were presented with a list of seven statements, one of which was the gist statement. The students were directed to "select the one sentence that best tells what the whole story was about."

Multiple choice questions. To assess main idea versus detail comprehension, a second task required the students to respond to 12, five-option multiple choice questions. Six of the questions probed information about main ideas; six questions assessed detail comprehension.

Main idea/detail recognition. A final comprehension probe required the students to examine a list of 12 statements and determine whether they were main ideas or details, or whether they were false statements

Scoring

Cued written recall gist statements that were identical or paraphrases of the actual gist statement received full credit; fragments of the gist statement received partial credit. Written recalls were scored by comparing the protocols to the list of linguistic subunits. Again, either full or partial credit was awarded. Since there were unequal numbers of main ideas and details, scores were converted to proportions for data analyses. The experimenter scored all cued recalls. An additional scorer independently evaluated 25 recalls at each grade level. Inter-rater agreement scores of .94 and .91 were obtained for the gist statement and written protocol evaluations. The remaining dependent measures were objectively scored: one point for a correct response, no credit for incorrect responses.

Design and Data Analyses

The study addressed two basic research questions: (a) how skillful are children at comprehending the gist for an entire passage, and (b) are students more skillful at comprehending main ideas or details after reading? The first

question was addressed by examining the descriptive data provided by the children's responses to the gist statement production and recognition tasks. The second question was addressed by conducting a series of nondirectional *t* tests that compared mean performance for the comprehension of main ideas and details for the written recall protocols, multiple choice tests, and main idea/detail recognition tests. Each test was evaluated at a .01 alpha level.

Results and Discussion

Gist Comprehension

Table 3 presents raw and percentage scores for the students' performance on the gist statement production (written cued recall) and recognition tasks. Inspection of the written cued recall data reveals that students at both grade levels were able to write a statement that presented the central thought for the entire passage only about one-third of the time. When percentages are collapsed across the three passages at each grade level, scores of 29.5 percent and 40.4 percent are obtained for the third and sixth grade respectively. Students' ability to correctly identify the gist statement from a list of statements exceeded their gist statement production ability. In all instances, the majority of students were able to successfully complete this task, and collapsed percentage scores of 68.8 and 71.8 were attained for the third and sixth grade respectively.

How can the difference between the students' performance on the gist production and gist recognition tasks be explained? The most straightforward explanation is that recall (production) and recognition are psychologically different processes, and that recognition comprehension consistently surpasses recall comprehension (see Kintsch, 1970; McCormack, 1972). Unfortunately, there is no research which directly explores children's ability

Table 3

Percentage of Students Correctly Producing and Recognizing Gist Statements

Passage	Written cued recall			Recognition		
	n[a]	Correct responses	Percent correct	n[a]	Correct responses	Percent correct
			Third grade			
A	27	8	33.3%	27	21	77.8%
B	28	9	32.1%	24	18	75.0%
C	28	7.5	26.8%	26	14	53.8%
			Sixth grade			
D	30	10.5	35.0%	29	22	75.9%
E	30	10.5	35.0%	28	19	67.9%
F	29	15	51.7%	28	20	71.4%

[a]Sample sizes differ between written cued recall and recognition because several students were absent at the second test sitting.

to recall or state the gist for an entire passage. Otto et al. (1968) required second and fifth graders to orally state (produce, recall) an inferred main idea from short (four-sentence) paragraphs. Only 29 percent of the second graders were able to compose an adequate main idea statement, although 64 percent of the fifth graders were successful at this task. Danner (1976) also devised a form of production task in which second, fourth, and sixth graders were asked to examine a group of four sentences that all related to a single theme (e.g., what a fox looks like, what foxes eat) and then state "what one thing do these four sentences tell you about." Across six such tasks, all students were highly successful at stating the theme. Students at all grade levels correctly described at least four of the six topics, and 79 percent of the students correctly identified all six topics.

Thus, it appears that children are reasonably skillful at stating the major theme for small units of text. But for larger texts, like those used in the present study (passage-length units), children have difficulty producing a similar statement that integrates information across a series of paragraphs. Interestingly, however, when presented with a recognition task, the majority of students can select or recognize a statement that captures the gist of an entire selection. In response to a similar discrepancy in Brown and Smiley's (1977) data, Baker and Stein (1981) suggest that "young children's sensitivity to main ideas is below their level of awareness" (p. 15). In other words, children may tacitly comprehend the central thought of a passage and hence recognize a gist statement, but alternately they may be unable to produce or construct a gist statement when required to do so. This explanation, along with the recognition/recall distinction, helps account for the children's different performance on the gist statement production and recognition tasks.

Main Idea Comprehension

Table 4 presents results for the three dependent variables used to assess main idea comprehension. Generally, there is no consistent pattern of results either within or between the dependent measures. The first section of Table 4 presents mean proportions of main ideas and details contained in the written protocols the children produced. Only two of the comparisons attained statistical significance: Third graders who read Passage B produced a significantly greater proportion of main ideas compared to details, and sixth graders produced a significantly greater proportion of details over main ideas after reading Passage E. The second section of Table 4 presents results for the multiple choice tests. Only one of these six tests reached statistical significance: Third graders who read Passage C correctly answered significantly greater numbers of main idea questions compared to detail questions. Results of the main idea/detail recognition tests are presented in the final section of Table 4. A statistically reliable tendency favoring the recognition of details was noted for third graders who read Passage C and for every sixth grade passage.

Viewed collectively, results from the three dependent variables designed to assess main idea comprehension do little to further the notion that children are inherently proficient at comprehending main ideas after reading expository prose. Out of the 18 tests that compared main idea versus detail comprehension, only two contrasts resulted in a statistically reliable tendency for greater comprehension of main ideas. All other tests were either not significant or indicated a difference favoring detail comprehension. These findings support previous studies by Baumann (1981), Dunn et al. (1979), Taylor

Table 4

Mean Scores for Third and Sixth Graders' Main Idea and Detail Comprehension as Measured by Three Different Tests

Grade and passage	Main ideas	Details	Mean difference	df	t
Written cued recall test[a]					
Third					
A	.159	.176	.017	26	0.65
B	.165	.083	.082	27	3.74*
C	.133	.144	.011	27	0.39
Sixth					
D	.442	.430	.012	29	0.38
E	.235	.367	.132	29	4.58*
F	.359	.328	.031	28	1.22
Multiple choice test[b]					
Third					
A	4.00	3.67	0.33	26	0.98
B	3.25	3.96	0.71	23	2.48
C	4.92	3.89	1.03	25	3.48*
Sixth					
D	4.86	5.28	0.42	28	2.08
E	4.32	4.64	0.32	27	1.51
F	5.64	5.32	0.32	27	1.59

Table 4 continued

Grade and passage	Main ideas	Details	Mean difference	df	t
		Main idea/detail recognition test[c]			
Third					
A	2.48	3.22	0.74	26	2.39
B	2.29	3.04	0.75	23	1.87
C	2.12	3.04	0.92	25	2.99*
Sixth					
D	2.24	3.69	1.45	28	3.98*
E	2.18	3.68	1.50	27	5.88*
F	2.21	3.71	1.50	27	5.47*

[a]Mean scores for the written cued recall test are proportions; hence, they can be interpreted as percentages (e.g., .159 = 15.9%).

[b]Mean scores for the multiple choice test are raw scores, and there were six main idea and six detail questions.

[c]Mean scores for the recognition test are raw scores, and there were five main idea and five detail items.

*$p < .01$

(1980), and Tierney et al. (1978-79) in which elementary students were unable to demonstrate superior comprehension of superordinate or main ideas compared to subordinate or detailed ideas. Interestingly, all these studies involved expository prose, whereas several of the studies in which children demonstrated greater skill at main idea comprehension (Brown & Smiley, 1977; Christie & Schumacher, 1975) employed narrative texts. As Baumann (1981) argued, it may be that since children have much exposure to narratives (listening to stories, reading them), they have considerable knowledge of them (i.e., well-developed schemata for simple stories), and hence are sensitized to story structure and readily comprehend main ideas in narratives. Conversely, since students get little exposure to expository prose prior to their encounter with content area textbooks (at about fourth grade), they have less knowledge of how nonfictional passages are constructed, and hence have difficulty grasping the central thoughts. A recent study by Boljonis and Kaye (Note 1) supports this argument. They found that fourth graders demonstrated superior recall of information presented in a narrative style compared to recall of the same information written in a nonnarrative style.

In addition to the discourse type (narrative/exposition), a second variable, encoding modality, may also explain why children sometimes appear to comprehend main ideas with skill and at other times do not. In all the studies in which children demonstrated skill at main idea comprehension (Brown & Smiley, 1977; Christie & Schumacher, 1975; Danner, 1979; Meyer, 1977; Waters, 1978), the students listened to the texts. In the present study as well as other experiments in which children were not highly skilled at main idea comprehension (Baumann, 1981; Dunn et al., 1979; Otto et al., 1968; Taylor, 1980; Tierney et al., 1978-79), the subjects silently read the experimental texts.

It would be logical to hypothesize, therefore, that listening promotes main idea comprehension and reading does not. A study by Hildyard and Olson (1978) supports this hypothesis. They found that elementary students exhibited differential comprehension patterns after reading and listening--a difference favoring main ideas after listening and details after reading. Thus, listening may bias comprehension toward main ideas, and reading may bias comprehension toward details. Further research will be required to evaluate this hypothesis.

Conclusions

Based upon the results of this study, two conclusions seem justified. First, elementary students who read expository (textbook) prose tend not to comprehend either the gist of an entire passage or its main ideas with great facility. This can be stated with a reasonable amount of confidence because the level of ecological validity for this experiment was high. That is, this finding was established within an environment that promoted external validity--a setting in which children in their classrooms read natural passages taken directly from the elementary curriculum and then responded to traditional measures of reading comprehension. It remains to be determined, however, whether children are skilled or unskilled at comprehending main ideas after reading narrative discourse.

Second, the main idea identification strategy developed for use in the present study proved to be both practical and useful. As evidenced by the high inter-rater agreement scores, this procedure was reliable. And given the intuitively simple and straightforward nature of the procedure, the face validity is also high. As a measure of concurrent validity, two of the texts

used in the present study (Passages A and D) were previously analyzed according to Meyer's (1975) prose analysis system (cf. Baumann, 1981). Of the 13 main ideas (seven in Passage A, six in Passage D) identified by the university students, nine (69%) were in the upper one-fourth of the corresponding text hierarchies produced by Meyer's system. And all but one of the 13 main ideas resided in the upper half of the Meyer hierarchy. Thus, there was much consistency between the new procedure and an established prose analysis system concerning the identification of hierarchically important (main) ideas. So although the procedure for identifying main ideas used in the present study is not based upon linguistic or psychological theory, it is well suited as a research tool for clearly and simply identifying the main ideas in a piece of prose.

In conclusion, in light of these findings, it would behoove educators to continue the practice of teaching students how to comprehend main ideas, especially in connection with content area reading materials. For researchers, efforts in two areas are appropriate. First, the concept of "main idea" needs to be more clearly defined, for as Pearson (1981) noted, "the term 'main idea' is but a main idea for a polyglot of tasks and relations among ideas" (p. 124). And second, researchers need to develop instructional strategies for teaching students how to comprehend the varieties of main ideas, and most importantly, assess the relative effectiveness of these teaching techniques.

Reference Note

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